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Operations and Maintenance Manual
Volume I
Site #356008

EG&G Rotron, Inc.
Olive Facility
Olive, New York

April, 2002

THE Chazen COMPANIES

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FIGURES:

1.0 INTRODUCTION

1.1 Project Description

EG&G Rotron, Inc. has conducted a Remedial Investigation (RI) at its Olive facility (NYSDEC Site Number 356008) in conformance to the Order on Consent entered into with The New York State Department of Environmental Conservation (NYSDEC). The RI incorporated Interim Remedial Measures (IRMs) to address solvent impacted soil and groundwater. The IRMs were described in a work plan submitted to the NYSDEC in July of 1996 and consisted of soils excavation and the installation of active mechanical remediation systems, including dewatering to address shallow and deep groundwater and soil vapor extraction (SVE), where contaminated soils could not be removed due to structural constraints. The NYSDEC required no further remedial action, based on the results of the investigation. The IRMs became the remedy.

1.2 Purpose of the O&M Manual

The purpose of this Operations and Maintenance (O&M) manual is to provide a description and a schedule for operating and maintaining the mechanical remediation systems installed at the Rotron-Olive site.

1.3 Site-Specific Safety Warnings

The remediation systems were installed in accordance with all applicable safety standards. There are, however, two areas where confined space entry is required to service pumps and level controls in two separate holding tanks. Confined space entry is required when servicing or replacing the pumps and level controls installed in the holding tank that supplies the primary and secondary stripping towers. Four additional existing confined spaces include the sumps in the loading dock and former solvent tank area, and two stormwater manholes. Entering these confined spaces is not anticipated. Normal confined space entry protocols are to be followed when entering any of these six spaces, which have been clearly identified as confined space entries. All other systems are designed to be fail-safe and cannot be operated without the appropriate safety devices or protective coverings in place.

Chemicals are not used in the remediation process or in the routine maintenance of the systems.

It should be noted that the water from the stripping towers is not potable and should not be used for consumption purposes. Although the discharge from the stripping towers typically meets the NYS drinking water standards for chlorinated solvents, it is not likely to meet the criteria for other routine water quality parameters.

1.4 Records Management

The remediation systems at the Rotron-Olive site are operated and maintained by the Environmental Services Group at The *Chazen* Companies (TCC), Poughkeepsie, New York. Operational details, system faults, repairs, general condition and other routine monitoring parameters are noted in field logs kept at the site and in duplication form at TCC's office. Routine monthly and quarterly sampling results are maintained at TCC's Poughkeepsie office and provided to the NYSDEC in monthly State Pollutant Discharge Elimination System (SPDES) sampling reports and quarterly project progress reports. TCC currently provides monthly monitoring of the remediation systems. Monitoring wells at the facility are sampled on a quarterly basis. Details of the sampling and monitoring requirements are outlined in Section 4 of this manual.

1.4.1 O&M Needs Summary

The existing remediation systems are designed to operate efficiently with little direct involvement. The systems are alarmed with telephone warning systems if they cease operating for any reason. When a system shuts down, for instance, due to a power outage, the telephone alarm system automatically sends messages to three separate locations and two different TCC employees. TCC employees are familiar with the systems and can restart them, as necessary.

The Rotron-Olive facility is currently in the post-closure monitoring phase of the project. The remedy has been implemented. O&M requirements include routine maintenance of the SVE and Scavenger Well systems and a long-term monitoring requirement that includes monthly system checks, monthly SPDES monitoring and quarterly groundwater and surface water monitoring.

1.4.2 O&M List of Official Records and References

The following reports or permits document the work done and requirements of the remedial systems and monitoring at the Rotron-Olive site. All of these documents have previously been provided to, or were generated by the NYSDEC:

- Inactive Hazardous Waste Disposal Site # 356008, *Remedial Investigation Report*, EG&G Rotron-Olive Facility, Olive, New York, September 1995

- Inactive Hazardous Waste Disposal Site # 356008, *Interim Remedial Measures Report*, EG&G Rotron-Olive Facility, Olive, New York, September 1995

- *Proposed Remedial Action Plan*, EG&G Rotron-Olive Facility, Olive, New York, Site No. 356008, New York State Department of Environmental Conservation, September 1996
- *Record of Decision*, EG&G Rotron-Olive Facility, Olive, New York, Site No. 356008, New York State Department of Environmental Conservation, December, 1996

2.0 SITE DESCRIPTION

The site is situated on Dubois Road in the Town of Olive, located in Ulster County New York (Figure 1 from the RI report, attached to this document for reference purposes). The site consists of approximately 150 acres surrounded by vacant land to the north and west and residential dwellings to the east and south. Structures on the property consist of a single-story manufacturing facility and an attached warehouse (Figure 2 from the RI report, attached to this document for reference purposes).

The facility is located on the north side of an east/west trending valley containing the Ashokan Reservoir and the Esopus Creek. The site is bounded by Little Tonshi Mountain to the north and Route 28 to the south. Perennial streams that originate on the south side of little Tonshi Mountain control drainage. The streams converge and drain into the Ashokan Reservoir. Numerous seasonal swamp areas contribute to the watershed, connected by a series of interconnected seasonal streams that flow past or into a fire pond on the Rotron-Olive property (RI report, Figure 2).

Sampling conducted during the RI indicated that industrial degreasers including Trichloroethylene (TCE), 1,1,1-Trichloroethane (TCA) and Freon 113 had impacted soils and groundwater. Contaminated soils were encountered in and around a former waste solvent tank grave, beneath the pavement in the loading dock area, at a dry well (Dry Well #1) located 400 feet east of the main building, along perforated Orangeburg pipe extending to Dry Well #1 and at a dry well (Dry Well #2) connected to the floor drains in the building. Trace levels of industrial degreasers were encountered in the abandoned quarry, but were not above the site-specific cleanup objectives. The findings are documented in detail in the IRM report previously submitted to the NYSDEC.

2.1 Site History

Rotron manufactured high velocity air moving devices and controllers at the Olive plant until it closed in 1985. Degreasers were used to clean the manufactured metal parts before assembly. Waste management and solvent-handling practices resulted in soil and groundwater contamination at the facility.

The historic use of the solvents TCE, TCA and Freon 113 have impacted groundwater and soils at the Rotron-Olive site. TCE was used throughout the 1960's and up to 1976 when the plant switched over to TCA. Freon 113 was used intermittently in ultrasonic parts washers but was used through 1985 when the plant closed.

Prior to 1981, wastewater impacted by solvents was disposed of in an on-site waste solvent tank, which emptied into a dry well (Dry Well #1). The 2,500-gallon waste solvent tank and dry well were located on the east side of the main building. Occasionally, wastewater impacted by solvents was trucked in drums to a former quarry area and disposed of on the ground surface or in drums. Some spillage also occurred as part of the virgin product handling processes.

After 1981, the waste solvents were removed from the site by solvent recycling vendors.

Numerous investigations and remedial activities occurred between 1981 and 1985. In 1981 and 1982, approximately 450 tons of contaminated soil was excavated; seven liquid filled drums were removed; numerous drum carcasses removed and the drainage routed away from the quarry. The surface of the former quarry was also shaped and graded to promote runoff and reduce infiltration.

Approximately 439 tons of solvent impacted soil was removed from the former drum storage area located on the northern edge of the loading dock parking area. Solvents were occasionally spilled during transport, especially during the winter months when the drums would freeze to the ground and rupture when moved. Solvents were also spilled in a drum storage area located immediately adjacent to the northeast corner of the main building.

The 2,500-gallon waste solvent tank was removed in the early 1980's but the Orangeburg pipe and dry well were left in place. When the tank filled, it was drained via gravity or pump along the Orangeburg pipe to Dry Well #1. Contaminated liquids seeped into soils surrounding the pipe but surprisingly little made it to the dry well.

The second dry well was connected to the floor drains of the building. Occasionally, solvents would spill onto the floor from the degreasing units and would be rinsed into the floor drain system. Soils surrounding the second dry well were impacted with chlorinated solvents.

Groundwater impacts were observed around the quarry. PW-1 was put into service as a scavenger well between 1982 and 1984. Impacted water was run through the existing cooling tower to remove volatile organic compounds (VOCs) and discharged to the fire pond. The two air stripping towers (Primary and Secondary) were added to address shallow groundwater drainage from the parking lot area. PW-1 was not pumped again until 1997.

Historically, groundwater impacts have been limited to the on-site wells. There have been a few detects in some of the perimeter and off-site wells but the last known off-site detection was in 1991. Recent perimeter monitoring indicates that the impacted groundwater remains within the confines of the site.

2.2 Groundwater Flow

The natural regional groundwater trend within the bedrock aquifer is likely to be towards the south, in the direction of the Ashokan Reservoir. Groundwater elevations generally decrease from north to south, although substantial variation is noted. The variation results from the presence of large, dominant water bearing fractures. There appears to be an eastward flow component but this may be an illusion created by the open borehole configuration of the monitoring wells, which vertically integrate water levels across all the water bearing fracture zones. Water table maps could not be constructed given the variation in heads observed at the wells. Conceptually, flow is towards the major east west trending valley located due south of the site.

Solvents would be expected to migrate south-southeast, under non-pumping conditions, based on the regional flow direction. Chlorinated solvents have been detected only sporadically in the perimeter wells on the southern and eastern limits of the site indicating that dilution and dispersion influence the contaminant transport mechanism in the bedrock aquifer.

Shallow groundwater in the loading dock area flows towards the man-made drainage systems on the eastern side of the loading dock parking area. Piezometers installed as part of the RI continue to depict an eastward flow direction. However, bedrock was encountered at very shallow depth in the loading dock area and it is likely that there is a vertical flow component into the bedrock aquifer. The loading dock area may be the dominant source of VOCs observed in PW-1.

Relevant boring logs are included in Volume II of the Operations and Maintenance Manual.

3.0 IRMS

The results of the IRMs are discussed in detail in the IRM report previously provided to the NYSDEC. The IRMs were designed to address those areas that clearly exceeded the NYSDEC soil cleanup guidance values and to limit the possibility of contaminated groundwater migrating off-site. Residual soil contamination was present at levels above the NYSDEC's soil clean-up guidance values in the loading dock area, solvent tank area, and dry well areas and along the Orangeburg pipe. Soils were excavated until they met the site specific soil cleanup objectives established in conjunction with the NYSDEC. Physical removal of impacted soils above the site-specific soil cleanup guidance values was the preferred alternative and was used wherever possible. In those areas where soils could not be excavated due to structural constraints, a SVE system was installed. Mechanical systems were only employed when soils could not be excavated.

Shallow groundwater contain and control systems were installed in the vicinity of the loading dock and former solvent tank grave to limit contaminant distribution via impacted shallow groundwater in these two areas.

PW-1 is operating as a containment and control scavenger well to limit the possibility of off-site migration.

The old quarry has been regraded to promote run-off. A stream, which was entering the old quarry, has been diverted. Both activities reduce surface water infiltration through the fill material.

A brief summary of IRM activities follows.

3.1 Soil Excavation

Approximately 5,620 cubic yards (roughly 6,500 tons) of soil was excavated from six different areas at the site. Soils were excavated until they met the site-specific cleanup objectives, to the extent possible and practical. Sampling results indicated that the site-specific clean-up objectives had been met, with two exceptions. Soils could not be excavated due to physical constraints imposed by the building foundation near the former waste solvent tank and drum storage locations. Mechanical systems were used to remediate those areas.

3.1.1 Solvent Tank

Data collected during the initial test pitting activities in this area indicated that between 900 and 1,200 cubic yards of soil were impacted by waste solvents. Rotron implemented an aggressive remediation strategy and excavated impacted soils, to the extent physically possible. The approximate boundaries of the excavation and the confirmatory data are shown on Figure 1.

The site-specific cleanup objectives were met on all sides of the excavation with the exception of small pockets of soil adjacent to the building foundation and beneath a fire suppression line (Figure 1). These soils could not be excavated without risking structural damage. A SVE system was installed to address the remaining residual VOC impacts. The SVE system was conditionally approved by the NYSDEC in November of 1996 and is discussed in this report under Section 3.3.2.

3.1.2 Dry Well #1

The RI determined that the 2,500-gallon waste solvent tank periodically drained into a dry well connected to the solvent tank by perforated Orangeburg pipe. The location of the dry well, referred to as Dry Well #1, is shown on Figure 2 from the IRM report, which was previously submitted to the NYSDEC. The dry well and approximately 20 cubic yards of material surrounding the dry well were excavated and stockpiled on-site for treatment and re-use.

Impacts around the dry well were limited to the permeable backfill immediately surrounding the dry well. The limited impacts resulted from depression in the Orangeburg pipe, in which free drainage of solvent impacted the wastewater. This resulted in a spreading into the soils at this depression.

A confirmatory laboratory sample was taken from the base of the excavation to verify that the clean-up objectives were met.

3.1.3 Orangeburg Pipe

Field screening performed during the Remedial Investigation indicated that the bulk of the contaminated soil was concentrated immediately adjacent to the pipe. Impacts were noted at locations along the pipe corresponding to apparent depressions or low spots in the pipe where natural damming likely occurred, resulting in slow seepage of fluids into the soils. Contaminants spread out around these depressions. Field screening and lab results indicated that contamination was concentrated in the upper few feet of the saturated zone and dropped off rapidly with increasing depth (IRM report).

A second VOC-impacted area was found at the junction of the Orangeburg pipe and the impermeable black iron pipe that was formerly attached to the waste solvent tank (Figure 2).

Approximately 1,200 cubic yards of soil were removed from the Orangeburg pipe areas. Obviously impacted soils encountered directly beneath the pipe were removed and stockpiled for treatment or disposal, as warranted. Representative soil samples were obtained from the excavation for laboratory analysis to confirm that the clean-up objectives had been met.

3.1.4 Dry Well # 2

Site plans identified a dry well near the northeast corner of the plant. This dry well, (Figure 2) referred to as Dry Well # 2, was connected to floor drains inside the main plant. The floor drains were located in sections of the building where manufacturing, assembly and parts-cleaning had historically occurred.

Impacted soils near the dry well were concentrated along the permeable backfill around the dry well, and extended somewhat south and east of the dry well. Approximately 1,100 cubic yards of soils were excavated from around Dry Well #2.

Excavations around Dry Well # 2 also showed that fill material surrounding the nearby 18-inch concrete storm drain was also impacted with VOCs (Figure 1). The highly permeability backfill material surrounding the pipe provided a preferred pathway for contaminant migration and transport away from the dry well. Approximately 200 feet of storm drain was replaced and roughly 1,000 cubic yards of soil were removed.

Field screening and representative laboratory soil samples were obtained from this region. The sample results demonstrated that the cleanup objectives have been met.

3.1.5 Loading Dock and Drum Storage Area

The dimensions of impacted areas in the loading dock and former drum storage area are shown on Figure 1. Contaminated soils were excavated from the vicinity of test pit OL-027, where free product was observed during test pitting activities, and from beneath and around the drum storage area.

Shallow groundwater was typically encountered less than two feet below ground surface in the test pits north of the building's footing drains. A system of dewatering trenches was installed to manage this impacted shallow groundwater in the loading dock area to limit the potential for migration elsewhere.

Once the soils were sufficiently dewatered, impacted soils were excavated in the loading dock area. Field screening during excavation confirmed that the cleanup objectives were met with the exception of the area beneath the former drum storage area adjacent to the building foundation.

Impacted soils adjacent to the building foundation beneath the drum storage area were not readily accessible without damaging the foundation. A SVE system was installed to remediate impacted soils adjacent to the foundation. The SVE system layout is shown on Figure 1 and is discussed in Section 3.3.

3.1.6 Former Quarry

Soil samples taken from the former quarry area indicated that the site-specific soil cleanup guidance values were met. No further soil remediation was necessary.

A diversion channel was installed above the quarry to redirect flow from the wetlands above the quarry around the quarry. The channel was excavated with a track-mounted excavator to a depth of approximately three to four feet below ground surface (bgs) or until the bedrock surface was encountered. The channel walls were sloped to limit channel collapses and the soils were bermed above the quarry to limit the possibility of breakthrough.

Soils taken from other portions of the site that met the site-specific soil cleanup guidance values were used to grade and shape the surface of the former quarry to enhance runoff. The clean soils were graded in six-inch lifts and sloped towards a central drainage swale running through the center of the quarry. Discharge from the swale drains to a wetlands area to the south side of the quarry. A vegetative cover has been established on the surface of the former quarry area and is in relatively good condition.

3.2 Excavated Soils Management

Excavated soils were temporarily staged in the main parking lot east of the facility. The excavated soils were predominately glacial till, containing a significant percentage of gravel to cobble sized stones. Soils were allowed to drain and then screened to remove the large stones, cobbles and any other anthropogenic articles. The screening process separated the soils into piles of mixed cobbles, boulders and man-made objects, and piles of fine to medium gravel mixed with fine to coarse sand and silt with trace amounts of clay.

The screened soils were stockpiled in different areas based on contaminant levels. Specifically, soils from the former solvent tank area, from the region surrounding test pit OL-027 (the area corresponds to the area around CB-N on Figure 1) where free product was encountered, and from beneath the former drum storage area were stored separately from soils taken from Orangeburg pipe area and the two dry wells.

One composite sample was taken per every 100 cubic yards of excavated soil to determine disposal requirements. Soil from the two dry well areas and the Orangeburg pipe met the site-specific cleanup values and was subsequently re-used as either backfill material in the excavations or as grading material in the former quarry area. Soil from the solvent tank area and around TP-027 required off-site disposal in an approved facility. AETS shipped approximately 1,763 tons (approximately 1,100 cubic yards) of contaminated soil to a secure chemical landfill operated by CWM Chemical Services, Inc. (EPA ID No. NYD 049 838 679) in Model City, New York.

Stones leftover from the screening process were used to backfill the solvent tank excavation and some areas of the Orangeburg pipeline. Washed gravel, stone and/or crushed shale from off-site sources was used to backfill the dewatering trenches. The permeable backfill enhanced drainage. The blacktopped areas were repaired after the trenches were brought to grade.

3.3 Active Mechanical Remediation Systems

3.3.1 SVE System Description and Normal Operations

Structural constraints limited full excavation of VOC impacted soils adjacent to the foundation in the former solvent tank area and the former drum storage area (Figure 1). Excavating in these areas would have damaged the building, and SVE systems were therefore installed to extract residual VOCs.

SVE extraction pipe has been installed at four locations on the site. The four locations, labeled A, B, C, and D, correspond to areas where solvent impacted soils above the soil cleanup guidance values could not be excavated. Area "A" consists of piping installed above the storm drain along the east side of the building; Area "B" vents the location of the former waste solvent tank; Area "C" vents soils that may have been imported by waste solvents migrating underneath the building adjacent to the former waste solvent tank; and Area "D" vents the former drum storage area and the soils beneath the slab adjacent to the former drum storage area. The existing extraction systems, described briefly herein, consist of four separate systems focused to control vapors in or adjacent to source areas identified as part of the RI investigation. Each system utilizes a Rotron Model EN 454 explosion proof, regenerative blower to provide positive soil venting by drawing approximately 120 cubic feet per minute (cfm) of air from the respective areas.

Air extracted by the four individual systems is discharged to atmosphere through a common stack eight inches in diameter and 20 feet high. Originally, the air from each individual system was routed through Calgon VentSorb® carbon filtration canisters before being discharged. Emission levels have now been reduced to a point where the VentSorb® canisters are no longer required. The carbon canisters induce restrictions to airflow and reduce the system's efficiency, so they have been removed. Should ongoing monitoring indicate a return to sufficiently high concentrations, warranting carbon treatment, the VentSorb® units will be returned to service.

As-built diagrams of the SVE units are shown on Figure 2. The layouts of SVE systems were installed as specified in the plan provided in the IRM work plan submitted in July of 1996. Specific construction details for each of the SVE areas installed are provided below. Appropriate catalogues and specification sheets are include in Volume II of the Operations and Maintenance Manual.

The blower configuration and treatment system is shown as-built on Figure 2. These drawings are modified versions of Figures 15 and 16, which were previously submitted to and approved by the NYSDEC along with the Application for a Permit to Construct and a Certificate to Operate the SVE systems.

Unit A: Storm Drain Area, Zones 1-3

During excavation and replacement of the 18" storm drain along the east side of the building, it was noted that the bedding material removed from around the pipe was contaminated. It was also apparent that the replacement bedding material would be in physical contact with the solvent tank excavation and provide a likely route of migration. To reduce the likelihood of vapor migration along the permeable backfill material, SVE vent pipe was placed in the trench directly above the new storm drain. Due to the length of the area to be treated and to provide better system control, the pipe was installed in three separate zones (Figure 1). Venting of the three sections (Zones 1-3) is independently controlled by a system of valves to regulate airflow. This system is connected to SVE Blower # 1 and is currently receiving air from all three zones.

Unit B: Solvent Tank Area, Zone 4

After completion of the IRM excavation, residual VOC contamination remained in soils that could not be safely removed adjacent to the foundation in the former solvent tank grave and beneath the fire suppression line south of the tank grave. To ventilate this area vertical and horizontal SVE extraction piping was installed. The vertical points were spaced approximately 12 to 15 feet apart and consisted of ten-foot lengths of perforated PVC pipe connected to short risers. These riser pipes were then connected together terminating in a single line connected to SVE Blower # 2.

This system provides positive ventilation of the former solvent tank grave. The vertically oriented, perforated PVC pipes were installed directly on top of the residually impacted soils. Some movement occurred during backfilling, and some of the pipes are as much as 30 degrees off vertical but this has no effect on the functionality of the system.

Unit C: Solvent Tank Area Sub-Slab SVE System, Zone 5

Air samples obtained from beneath the floor of the building in the area adjacent to the solvent tank grave contained low levels of VOCs. To control vapor migration from beneath the concrete floor, SVE pipes were installed to maintain negative pressure under this section of the building. The footing wall was penetrated at approximately two feet below ground surface just below the base of the concrete slab. Six 1.5-inch diameter holes were installed through the footing wall, approximately one foot apart. A one-inch solid PVC pipe was placed into each hole extending through the foundation wall and sealed to the concrete to ensure that air was extracted from beneath the building. The one-inch solid PVC pipes were connected to a two-inch manifold, which was connected to SVE Blower #3.

Unit D: Former Drum Storage Area, Zones 6-7

Unit D extracts vapors from the former drum storage area and from beneath the floor slab adjacent to the drum storage area. Airflow, from the two separate zones of Unit "D", is independently controllable by valves.

Air is extracted from beneath the former drum storage area by a horizontally buried perforated PVC pipe located approximately five feet bgs. This pipe is connected to SVE Blower #4 through a control valve (Zone 6).

The sub-slab system in the loading dock area was installed by penetrating the footing wall at approximately two feet bgs and below the base of the concrete floor. Six 1.5-inch diameter holes were installed through the footing wall, approximately one foot apart. A one-inch solid PVC pipe was placed into each hole and sealed to ensure that air was extracted from beneath the building. The one-inch solid PVC pipes were connected to a two-inch manifold, which is also connected to SVE Blower #4, through a control valve (Zone 7).

The layout of the SVE systems is shown on Figures 1 and 2, which were previously submitted to and approved by the NYSDEC along with an Application for a Permit to Construct and a Certificate to Operate the SVE systems.

3.3.2 Dewatering Systems

Groundwater was encountered one or two feet bgs in formerly remediated areas in the loading dock area and as high as four feet bgs in the former solvent tank excavation. Test pits near these areas of disturbed soils consistently showed high water levels. The observed high water levels represented temporary catchment of interflow, which slowly recharges deeper groundwater.

Loading Dock Area

A sump was installed within a depression in the parking area adjacent to Test Pit OL-027 (Figure 3). The sump, excavated to a depth of eight feet, maintains drawdown at around seven feet bgs beneath the sump and within the area of formerly excavated soils. Water evacuated by the pump is routed to the Primary Stripping Tower.

French drains, shown on Figure 3, extended the area drained by the sump. The French drains are sloped to promote drainage to the main sump chamber. The 8-feet deep trenches were backfilled with six inches of crushed stone and four-inch perforated PVC drainpipe wrapped in filter fabric extending to the sump. The PVC pipe was covered with pea stone and the remainder of the trench was backfilled with either clean fill from an off-site source (crushed stone or shale), boulders and cobbles from soil screening operations or clean soil material extracted from the trench. Details of the French drains are shown as-built on Figure 3.

The investigation showed that soils along 125 feet of existing footing drain along the building were also impacted with VOCs. The permeable backfill material surrounding the pipe provided a preferential pathway for contaminant migration. The VOC impacted soils and 125 feet of footing drain were excavated and replaced with eight-inch perforated PVC drainpipe wrapped in filter fabric, and surrounded by clean washed stone.

Solvent Tank Area

The solvent tank excavation was backfilled with permeable fill. Interflow flooded installed SVE lines in the solvent tank grave after a heavy rainfall shortly after initial installation. A sump pump was installed in the permeable backfill to dewater the tank grave. The location of the sump pump is shown on Figure 3.

The pump lies approximately ten feet bgs and water from the tank grave sump is routed to the Primary Air Stripper (Figure 3). This modification has allowed successful operation of the SVE system since the dewatering well was installed.

3.3.3 Groundwater Remediation System Description and Normal Operations

The groundwater remediation system installed at the Olive facility consists of a series of three air stripping towers along with the tank pumps and piping necessary for operation. The components of the installed water treatment system receive water from up to five different source areas and this water will undergo treatment through one or more of the three air strippers before being discharged to a pond located on the property. An as-built drawing of the system is shown on Figure 3.

Groundwater is pumped from former production well #1 (PW-1) at a rate of 10 gpm and delivered to the top of a 24-foot high, 12-inch diameter packed column air stripper (PW-1 Stripper, Figure 4). The effluent from the PW-1 stripper is delivered by gravity to a 2,000-gallon underground dosing tank located to the northeast of the stripper shed (Figure 3). This underground tank also receives groundwater from the building footing drains located along the north side of the building, groundwater from a sump located under the paved loading dock on the north side of the building, and groundwater from a sump located in the area of the former solvent tank adjacent to the east side of the building.

The sumps were installed to de-water their respective areas and since VOC impacted groundwater was found in each of these areas, these sumps greatly reduce the possibility of off-site migration of contaminants. Additionally the increased aeration zone provided by the de-watering sumps enhances the effectiveness of the SVE systems installed in the excavated areas (Figure 3).

Water from the holding tank is pumped to the top of a 24-foot high, 36-inch diameter packed column air stripper (Primary Stripper) whenever the tank reaches capacity as determined by floats installed within the tank. Discharge from this air stripper flows by gravity to an underground storm sewer which flows southward along the east side of the building.

This underground storm sewer conveys surface runoff collected from the north area of the building, including the paved loading dock area, and discharges the runoff to a small pond located on the property. En-route to the pond the combined storm-water runoff and Primary Stripper discharge is collected and processed through another 36-inch diameter packed column air stripper (Secondary Stripper). The combined capacity of the Secondary Stripper's dosing pumps is 140 gpm. During periods of high surface runoff, the combined flow through the storm sewer may exceed the capacity of the secondary stripper tower and the excess water is allowed to pass untreated (Figure 4). However, the untreated water is highly diluted by runoff and is not likely to pose a threat to the environment.

3.4 Treatment Systems Evaluation

3.4.1 Air Filtration with Granulated Activated Carbon (GAC)

Carbon filtration units were originally installed on the SVE system (Figure 2) to filter VOCs from the discharge vent. Initial influent and effluent vapor data from the SVE lines in the drum storage area (Unit D) indicated TCE influent levels around 156.7 parts per billion (ppb). After carbon filtration, the output was 3.8 ppb. The carbon filtration units typically remove greater than 97 percent of the VOCs. The effluent from the combined SVE systems is currently less than 0.03 pounds per hour total VOCs (IRM report, TCC, 1996).

Current effluent limits are less than 0.0003 pounds per hour. Carbon is no longer needed to meet the discharge limitations.

3.4.2 Groundwater

The capacity of the air-stripping tower was evaluated to determine if additional treatment capacity for water was necessary. Contaminated groundwater is currently treated through up to three air-stripping towers before discharging to the fire pond on site, as shown schematically on Figure 4. The Primary treatment tower and PW-1 tower are located near the northeast corner of the main plant. PW-1 stripping tower treats 10 gpm and the Primary stripping tower has a rated capacity of 140 gpm. The secondary treatment system acts as a scrubber and has a rated capacity of 150 gpm. The discharge to the fire pond is regulated under a NYDEC SPDES permit (NY-0260401). A copy of the SPDES permit is included in Volume II of the Operations and Maintenance Manual.

Current base flow to the system is estimated at between 5 and 50 gpm under non-storm conditions. Base incorporated flow from the two sump pump systems (0-20 gpm), flows from the footing drain (0-20 gpm) and interflow drainage to the catch basin system (5-10 gpm). PW-1 stripping tower has been added to the system and contributes approximate 10 gpm for combined, typical flows of between 15 and 60 gpm.

Any combination of storm water and base flow above 140 gpm exceeds the combined primary and secondary stripping tower treatment capacity. The system is fully capable of managing all stormwater and groundwater in rainfall or snowmelt that is discharged at an equivalent rate of up to 0.5 inches per hour over a 24-hour period. Flows in excess of 0.5 inches per hour overload the capacity of the system.

3.4.3 Air Stripping Tower Efficiency

Recent influent samples taken from PW-1, Primary and Secondary towers indicate that the towers are approximately 96 percent to 99 percent efficient in removing VOCs from the groundwater. The combined system is capable of treating total VOC loads of between one and two parts per million (ppm) before effluent discharge limits might be exceeded.

3.4.4 Groundwater Flow Control

Concerns were raised by NYSDEC as to whether using PW-1, as a scavenger well, was feasible and practical. Rotron-Olive has implemented PW-1 as a scavenger well. Recent groundwater samples indicate that the well is impacted with VOCs at levels above groundwater standards. Well PW-1 is pumped continually at a rate of between nine and eleven gpm to maintain a cone of depression that extends to PW-3.

A schematic diagram of the scavenger well system is shown on Figures 4 and 5. Groundwater will be pumped directly from PW-1 into the PW-1 air-stripping tower. Effluent from this treatment tower is discharged directly into the holding tank located near the stripping tower shed. The holding tank also collects water from both the loading dock and solvent tank sumps. Water collecting in this holding tank is pumped directly into the Primary stripping tower. The effluent from the primary tower is discharged to the storm drain system, which flows into the reservoir for the secondary stripping tower. When sufficient water is available in the reservoir, the water is pumped through the stripping tower for final polishing before being discharged to the fire pond. The secondary system was designed to be bypassed if combined treatment effluents and stormwater flows exceed 140 gpm. Those occasions are rare.

3.5 Goals of the IRMs

The goals of the IRMs are to bring the site into compliance with the applicable standards, criteria and guidelines, to the extent practical and feasible and to ensure that the problem does not impact off-site residential water supplies. With two exceptions, all of the confirmatory samples obtained in the excavation areas met the Soil Cleanup Guidance Values for the chemicals of concern listed in TAGM 4046. In those areas where the TAGM 4046 values were not met, soil vapor extraction systems were installed to actively remediate the residual source area. Confirmatory soil samples will be taken from those areas at the end of the first five years of operation (DEC 2002) to determine if soil remediation is occurring. If the soil cleanup guidance values are met, the SVE operation will be discontinued. If not, other options may be considered to address the residual impacts including, but not limited to, continued operations of the SVE units.

No impacts have been observed in the perimeter wells since the scavenger well, PW-1, and the north and east dewatering systems have been in operation. Since the foremost goal of the system has been to ensure that the adjacent water supplies are not impacted. The goals are being successfully met. There is no evidence that groundwater quality has improved; however, there has not been a significant gain since the operation was implemented. Improvements to groundwater quality will be forthcoming but geologic and hydrogeologic conditions have had a negative impact of the rate of cleanup. The soils beneath the site are made up of dense clay rich, glacial till and bedrock is very shallow and highly fractured. Based on the nature of the release, there is likely to be residual contamination in the fractured rock that will degrade slowly over time.

The ultimate goal of the project is to achieve the groundwater standards listed in TOGS 1.1.1. However, this is likely to be impractical. Changes in chemistry levels will be tracked periodically until such time that steady state conditions are observed in PW-1 at levels that don't exceed the standards by more than 100%.

Guidance values for groundwater under TOGS 1.1.1 will be consulted for cleanup levels. Upon fulfillment of goals, Rotron-Olive will continue to meet discharge limits specified under the SPDES permit.

4.0 POST REMEDIATION MONITORING, TESTING AND RECORDS

4.1 Monitoring Plan

The monitoring plan includes the following elements:

- Groundwater
- Surface Water
- Visual Assessment
- SPDES Compliance
- SVE System
- SVE Air Quality
- Groundwater Remediation System

Samples are obtained monthly or quarterly as specified in this section.

4.2 Environmental Effectiveness Monitoring

The current monitoring program has effectively been tracking the progress of the remediation systems. The monthly monitoring of the control systems has provided a reasonable database from which all future decisions can be supported. The results are reflective of any significant changes or trends in groundwater or air quality levels and indicates that the current systems have reduced the contaminant load and are likely to significantly reduce the potential for impacts to the adjacent private water supplies. Monitoring of the on-site production well, PW-3 indicates that the potable water supply for the facility meets the applicable drinking water standards.

The effectiveness of the environmental monitoring programs is documented in the quarterly project progress reports.

4.2.1 Groundwater

Production well PW-3, scavenger well PW-1, abandoned production well PW-2, piezometers PZ-20, PZ-22, PZ-26, and PZ-27, and groundwater monitoring wells MW-4, MW-5, MW-6, MW-9, MW-10, MW-11 and MW-12 will be monitored quarterly. The locations of these monitoring wells are shown on Figure 2, of the RI Report, which is attached to this document. Periodically, the sampling frequency will be re-evaluated based on the relatively stable groundwater conditions observed in the existing sampling results. Very little real variation is observed in any of the sample results and there have been no impacts detected at the perimeter wells since the IRMs were completed.

The production wells are sampled in various ways. PW-1 and PW-3 have dedicated pumps installed in the wells and sampling ports installed in the treatment shed and inside the pump house, respectively. Since PW-1 runs continuously as part of the scavenger well system, no purging is required prior to sampling. A sample is taken from the dedicated sampling port located inside of the main treatment shed (Figure 2). The sampling port is clearly labeled on the inlet side to the PW-1 stripping tower. Since all of the wells are sampled for the same parameters using similar methods, the generic sampling procedures are discussed later in this section.

PW-3 is sampled in the pump house (Figure 2) at a dedicated tap. The pump is configured so that it can be manually operated so the level indicator in the production well holding tank can be bypassed. The switch is clearly labeled and flipped to the "hand" position. The bypass valve is opened and the well is purged of three well volumes prior to sampling. Once the well has recovered after purging, a sample is obtained via a sampling port installed prior to discharge into the PW-3 holding tank located behind the pump house. The PW-3 holding tank is a 10,000-gallon concrete tank designed to provide water under pressure to the facility via gravity flow. When sampling is completed the bypass valve is closed and the pump switch flipped to "auto".

PW-2 never produced usable quantities of water and hence had the well pump removed. Consequently, a pre-cleaned submersible pump, capable of pumping more than five gallons per minute at a depth of approximately 155 feet bgs, is utilized to purge this well.

Sampling will be performed as follows:

1) Prior to sampling, water level data will be collected using an electronic water level meter to calculate well volumes. Well volumes are calculated by measuring the height of the water column (height of water column = water level – well bottom elevation), and then multiplied by a well diameter conversion factor. A single instrument will be used to evaluate all water level measurements. The water level meter will be decontaminated between measurements using an Alconox® solution to prevent cross contamination between wells.

2) Prior to well sampling, wells must either have just been developed, or the wells must be purged to ensure that static annular water is removed from the well column.

3) Wells will be purged using a dedicated submersible pump, a portable submersible pump, a bailer or an inertial lift pump.

4) During purging, routine water quality parameters including pH, temperature, conductivity and turbidity will be monitored using a portable meters. Turbidity will also be assessed visually to determine when groundwater conditions have stabilized. In general, three or more well volumes will be removed before sampling.

5) Samples will be collected from monitoring wells once static water levels recover to not less than ninety percent of the pre-purging levels but not more than 24 hours following purging.

6) Groundwater samples will be analyzed for volatiles using EPA methods 8260 plus Freon 113 following contract lab protocol ASP Level B QA/QC data requirements. Temperature, pH and specific conductance will be measured in the field, where possible. If applicable, quality assurance samples will be taken including the collection of duplicate samples, field blanks, trip blanks and equipment blanks. Samples will be transported to the laboratory with ice or ice packs in secure coolers.

4.2.2 Surface Water

Surface water samples will be taken quarterly at two or three locations on-site. One sample will be taken from the stream located to the north of the quarry (SW-QUA);

one sample will be taken in the wetlands located on the downstream side of the quarry (SW-MW4) if standing water is available; and one sample will be taken from the stream adjacent to PW-2 (SW-PW2).

Additional surface water samples are taken as part of the SPDES program and those results will be summarized in the quarterly project progress reports. The surface water samples are obtained in the following manner:

1) Hollow tube or staff gauges have been installed at the sampling locations. The depth to water outside and inside the hollow tubes will be measured.

2) Surface water samples will be collected by submerging the sample vessel's mouth downward into water and then rotating the vessel upward, underwater to fill the vessel.

3) Surface water samples will be analyzed for volatiles using EPA Method 8260 plus Freon 113. If applicable, quality assurance samples will be taken including the collection of duplicate samples, field blanks, trip blanks and equipment blanks. Samples will be transported to the laboratory with ice or ice packs in secure coolers.

4.2.3 Visual Assessment of Drainage Modifications

As part of the IRMs, a stream that was draining onto the surface of the old quarry was re-routed to the east towards a wetland area that drains into another area away from the wetlands. A channel was cut into the side slope and a berm was built on the downstream side of the channel to force the water away from its natural drainage course. The diversion channel has effectively routed water away from the former disposal area and, thus reduced infiltration into this zone.

The surface of the old quarry was also shaped and graded to channel runoff away from the fill area and into a wetlands immediately to the south of the fill area. A central channel was cut in the quarry, sloping southward.

During quarterly monitoring the two features described above are visually evaluated for structural integrity. The features are evaluated for excessive erosion, channel cuts, stressed vegetation, animal burrows, debris accumulation, and other natural or manmade activity that could impact the structural integrity of these features and impact performance. Any potential problems are dealt with immediately upon discovery. For example, accumulating debris that may dam up the stream flow is physically removed.

4.2.4 SPDES Compliance

SPDES data are collected monthly at two discharge points (SPDES 002A, discharge into the pond from the treatment system and SPDES 002B, overflow from the pond). Although required by another NYSDEC division, this data is provided with the quarterly reports because it provides a measure of scavenger well (PW-1) remediation system performance.

Each discharge sample will be analyzed for volatiles using EPA methods 8260 plus Freon 113 requirements. Temperature, pH and specific conductance are measured at each discharge location and the information is recorded in a field book. Copies of field sheets are maintained in the file and provided to the DEC, as warranted.

4.3 Well Maintenance Procedures

4.3.1 Well Inspection and Maintenance Requirements

Wells will be inspected during quarterly sampling events. Each well will be checked to assure that the well is intact, the well cap is sealed and locked, and the protective well casing is unharmed. Any damaged wells will be quickly repaired.

4.3.2 Well Decommissioning Procedures

If necessary, wells will be sealed and restored to a safe condition to prevent contaminant migration, according to NYSDEC protocol, as follows:

1. The casing will be removed to the extent possible, followed by perforation of any casing left in place.

2. The well will be sealed by pressure injection with cement bentonite grout and will extend the entire length of the boring to five feet bgs or the excavated level. The screened interval of the borehole will be sealed separately and tested to ensure its adequacy before sealing the remainder of the borehole. The upper five feet will be backfilled with appropriate native materials compacted to avoid settlement. If necessary, alternate methods will be used to prevent the migration of the grout into the surrounding geologic formation.

3. After sealing, the site will be inspected periodically for settlement or other conditions, which require remediation.

4.4 On-Site Treatment System Performance Monitoring

4.4.1 SVE System

SVE system influent and effluent will be monitored monthly. The data will be evaluated yearly to determine if further vapor extraction is warranted. Confirmatory soil samples will be taken quarterly to verify the monthly field screening results.

The SVE has been operating at steady state conditions for the past three years; (refer to Volume II of the Operations and Maintenance Manual, SVE Air Quality Data). It is likely that the impacts against the foundations have been reduced. Soil samples may be obtained adjacent to the foundations to determine if the site-specific cleanup objectives have been met.

4.4.2 SVE Air Sampling

Effluent samples will be collected for laboratory analysis using VOC purge traps, per the manufacture's instructions. Each sample will be sent to an approved laboratory accompanied by appropriate chain of custody records. At the laboratory, the samples will be thermally desorbed and analyzed using EPA Method T017 plus Freon 113. This analysis will be preformed within the acceptable holding time for the adsorbent media.

Four effluent samples will be collected, one from each blower unit. The concentration results obtained from these samples will be combined with the appropriate flow measurements, obtained via pressure readings, and a computation made of the mass of removed VOCs. Performance data will be calculated using the following equation:

> (Total Air Discharge in cfm) x (Reported Concentration of each Constituent in ppm by volume) x (Density of each Constituent at Standard Temperature and Pressure) = Emission Rate

Emission rate information will be included in the quarterly monitoring report. The results will be provided in both a tabular and graphical manner on a cumulative mass balance basis. Data will be provided for cumulative removal of total VOCs and each detectable major compound of concern for an annual period and total time of operation of the remedial system.

In addition individual samples will be collected from Unit A, Zones 1,2, and 3, and Unit D, Zones 1, and 2. To isolate the individual Zones for sampling the control valves for the other zones connected to the same blower will be closed. The blower is then allowed to purge the lines for 20 minutes to insure a fresh sample. This process will be repeated until all zones are sampled. The valves and sampling ports to be used are clearly labeled and are shown as-built on the attached Figure 2.

The individual zone samples will be used to track progress towards the clean-up objective. As the objective is met, the control valves will be positioned to optimize efforts to the most heavily contaminated areas.

If VentSorb® carbon canisters are being used one additional sample will be collected from the effluent port of each of the VentSorb® units. This sample will be collected to insure compliance with discharge limitations and will be collected prior to obtaining individual zone samples so as to obtain a sample representative of the normal operating configuration.

4.4.3 Groundwater Remediation System

The groundwater remediation system installed at the Olive facility consists of a series of three air stripping towers along with the tank pumps and piping necessary for operation. The components of the installed water treatment system receive water from up to five differing sources and this water will undergo treatment through one or more of the three air strippers before being discharged to a pond located on the property. A schematic drawing of the system is shown on Figure 4.

Groundwater is pumped from former production well #1 (PW-1) at a rate of 10 gpm, which is delivered to the top of a 12-inch diameter, 25-foot high packed column air stripper PW-1 Stripper (Figure 4). The effluent from the PW-1 stripper is delivered by gravity to a 2,000-gallon underground tank located to the north east of the stripper shed. This storage tank also receives groundwater from the building footing drains located along the north side of the building and groundwater from two sumps. One sump is located under the paved loading dock on the north side of the building, and the other is located in the former solvent tank grave adjacent to the east side of the building.

The influent and effluent from PW-1 are sampled monthly. Effluent discharges to a holding tank located immediately to the east of the treatment shed. Water from the holding tank is pumped to the top of a 36-inch diameter, 30-feet high packed column air stripper (Primary Stripper) whenever the tank reaches capacity as determined by floats installed within the tank. Discharge from the Primary Stripper flows by gravity to an underground storm sewer, which flows southward along the east side of the building. Influent and effluent from the Primary Stripping tower can also be sampled through dedicated sampling ports.

This underground storm sewer conveys surface runoff water collected from the north area of the building, including the paved loading dock area, and discharges it to a small pond located on the property (Fire Pond, Figure 2). The storm sewer also conveys roof run-off (Figure 3). Enroute to the pond the combined storm-water runoff and Primary Stripper discharge is collected and processed through another 36-inch diameter packed column air stripper (Secondary Stripper). The combined capacity of the Secondary Stripper's dosing pumps is currently 140 gpm. During periods of high surface runoff, the combined flow through the storm sewer may exceed this capacity and the dilute, excess, water is allowed to pass untreated to the fire pond. The system was designed to ensure that all of the flows from PW-1, the sumps, the curtain drain and base flow would be entrained in the Secondary Tower storage basin and treated. Flows in excess of 140 gpm would only occur during periods of excessive rainfall (more than 0.5 inches per hour for a 24-hour period, see IRM report for details). The presumption is that flows in excess of 140 gpm would be substantially diluted and no impacts to the surface water body are likely to occur. For all intent and purposes, the PW-1 and Primary Stripper reduce the contaminant load to nearly zero. PW-1 and Primary Stripping towers are not affected by precipitation nor do they ever treat precipitation.

Influent and effluent from the Secondary Stripping Tower are also sampled monthly. Samples are obtained from the installed dedicated sampling ports.

Sampling of the influent and effluent will be performed as follows:

1. Samples must be collected while the systems are operating. PW-1 operates continuously so this is not a problem; however, both the primary and secondary strippers run when sufficient water is available in the holding tanks to trigger the high level switch. If the systems are not running during sampling they can be triggered manually by flipping the pump switch to "hand".

2. Samples are collected by opening the stopcock on the dedicated sampling ports and filling up the appropriate VOA vials.

3. The samples are analyzed using EPA Method 8260 plus Freon 113.

4.5 Analytical Program

All samples are collected in accordance with the Quality Assurance procedures outlined in the Quality Assurance Project Plan, previously provided to the NYSDEC.

4.5.1 Schedule

A schedule of sampling activities can be found in Operation and Maintenance Manual Volume II, Section H.

4.5.2. Laboratory Certification

The laboratory selected to conduct chemical analysis will be Environmental Laboratory Accreditation Program (ELAP) certified for each selected methodology.

4.5.3 Quality Assurance and Quality Control

Specifics on laboratory and TCC control and assurance of laboratory quality can be obtained in the Quality Assurance Project Plan, previously provided to the NYSDEC.

4.6 Record Keeping and Reporting:

All operational notes, observations, and system maintenance will be documented in the record book. This record book is maintained in the Primary Stripper shed as a permanent record of operations.

In addition to the permanent record book, observations recorded as part of the required monthly and quarterly monitoring will be recorded on forms provided for this purpose. A copy of all completed forms will be keep on file at the office of TCC and, in addition, copies of the completed forms will be forwarded to the NYSDEC along with the quarterly monitoring report.

5.0 MAINTENANCE

The following details periodic maintenance required for successful operation of the SVE and Groundwater Remediation systems. Schematic diagrams of the electrical systems are provided in Volume II of the Operations and Maintenance Manual. The SVE and Groundwater control panels are diagramed including a parts description, where appropriate.

5.1 Site Security

5.1.1 Site Fence

The Primary and Secondary Stripper Sheds have been secured to prevent unauthorized entry. Only TCC maintains keys to both buildings.

5.1.2 Site Signs

Two types of signs exist at the Rotron-Olive site:

1. Informational signs are posted at the two SPDES outfalls identified as SPDES 002a and SPDES 002b. At each outfall location, a sign identifies the location into the pond as a "New York State Permitted Discharge Point" and also identifies the SPDES Permit #, the Outfall #, and contact information.

2. Danger signs are posted at each of the six confined spaces. Signs identify the location as a hazardous area and state that unauthorized personnel keep out.

5.1.3 Site Cover

Areas of the site where surface structures were implemented or installed include the former industrial landfill area in the old quarry and the solvent tank area. All other areas where remediation occurred were simply graded to match existing topography or paved over. No manmade covers or membranes or barrier protection layers were installed.

The former solvent tank area was graded to the east to promote runoff. Portions of this excavation are paved and the remainder has been seeded with grasses consisting of native species that thrive in this environment. Adequate grass cover exists over the area. Grass is maintained on the surface of the old quarry to reduce the amount of infiltration occurring and limit the possibility of erosion. The grass is not maintained by mowing. A good vegetation cover exists naturally.

5.1.4 Runoff Control Structures

The former landfill area has been shaped and graded to slope towards a center line drainage swale. The centerline drainage swale slopes from north to south and discharges to the swamp to the south of the old wetlands during periods of heavy precipitation. Prior to implementing the IRMs at the facility, a small stream discharged into the quarry area. This stream was diverted in a trench to the east around the quarry area. An earthen berm was created to ensure that the trench integrity is maintained.

5.1.5 Vehicle Access Road

All of the areas of the site having undergone remediation are easily accessible. The treatment sheds, dosing tanks, sumps and discharge location are all readily accessible.

The former industrial landfill area is accessible by truck along a dirt road. Occasional maintenance is required to ensure access along the roadway. Access to monitoring wells is difficult. All of the wells are accessible along former logging roads; however, road travel requires an all-terrain vehicle. Generators are required to run the dedicated pump installed in each of the wells. Carrying the necessary well sampling equipment by hand is impractical given the distances covered to sample the wells. Occasional clearing may be required to ensure access to the monitoring wells.

5.1.6 Vermin and Vectors

Muskrats and frogs have presented operational problems at the Secondary Stripping Tower. Mesh screens were installed over the inlet to the tower to prevent larger animals from entering the unit. The site will be monitored monthly for vermin problems at the pump inlets in other areas. Any identified problems will be rectified on a case by case basis.

The former landfill area is inspected for burrowing animals. If evidence of burrowing animals is observed appropriate steps will be taken to ensure the drainage characteristics of the landfill surface are not affected.

5.2 SVE System Maintenance

Prior to starting any SVE blower, insure that the airflow control valves associated with that blower are in the open position.

Each blower unit is equipped with an individual control box containing a motor contact switch; overload relay, operational controls, and an indicator light. To start or stop individual blower motors, press the appropriate operator button on the blower's control panel. (See fault reporting in next section before stopping any blower).

5.2.1 Fault Reporting System

The SVE system is connected to an automated fault reporting system. This system will phone appropriate personnel and report a fault condition should one or more of the blowers cease operation for more than five minutes. To prevent activating the fault reporting system, place the appropriate zone switch, located in the alarm control panel, in the bypass position prior to turning off a blower for an extended period during servicing or testing. Return the alarm system to normal operation as soon as the blower is returned to service.

5.2.2 Electrical Failure Reset

The SVE blowers are each powered by a three-phase electric motor. These motors will shut down whenever there is an interruption to the electrical service and will have to be manually restarted. Should a system shutdown occur, the automated fault reporting system would notify appropriate personnel. However, the system should be checked for proper operation whenever there is an indication that an interruption to electrical power is likely to have occurred.

5.2.3 Monthly Maintenance and System Checks

The following actions are performed routinely upon inspection:

Mechanical Checks

1. Check and confirm operation of all four SVE blowers.

2. Check operating temperature of each SVE blower. They should be warm to touch but not hot and all four blowers should be about the same temperature.

3. Listen to each blower for any strange noises. They should all sound the same.

4. Check each blower for visible signs of wear or damage.

5. Visually check for kinked or disconnected pipes and listen for air leaks.

6. Remove drain plug and stop blower to remove any accumulated water from the water separators installed on SVE Unit "A" and Unit "B". Replace drain and restart blower. (Note: If blower is left off for more than five minutes a fault condition will be reported by the alarm system.)

Air Pressure Monitoring

1. Monitor and record individual influent blower air pressures. If VentSorb® canisters are installed it is also necessary to monitor the blower effluent pressure. This should be measured before the VentSorb® container; it is not necessary to monitor the pressure down-stream of the VentSorb® units. This pressure information is utilized to calculate the volume of airflow through each SVE system to insure compliance with discharge limitations and to insure the system is performing to design specifications.

Maintenance

The SVE blowers installed are sealed units with explosion proof motors. These units do not require any routine or preventative maintenance in addition to the mechanical checks listed above.

5.2.4 Quarterly Maintenance and System Checks

Maintenance of the SVE system is not required on a quarterly basis.

5.2.5 Semi-Annual or Annual Maintenance and System Checks

The following actions are performed semi-annually or annually:

1. Inspect all pipes and joints for signs of cracks or breaks.

2. Provide annual service on the blowers, as warranted, to ensure smooth operation. Any worn parts are replaced.

5.2.6 Disposal of Used Materials and Waste

At the present time, the SVE system generates no waste for offsite disposal. Should the need arise for effluent carbon treatment, Calgon VentSorb® carbon filtration canisters will be installed on the appropriate effluent lines. Should subsequent laboratory analysis indicate the need for replacement of a carbon canister, the spent carbon will be returned to the manufacture for reclamation or disposal.

5.2.7 Troubleshooting

Troubleshooting of the SVE system can be referenced in Volume II of the Operations and Maintenance Manual.

5.3 Groundwater System Maintenance

5.3.1 Normal Start-up and Shutdown Procedures

Primary Stripper, PW-1, and Sump Pumps

All operations of the groundwater treatment system located in the Primary Treatment Shed are controlled through a single control panel. The panel is suitably labeled and each switch is appropriately marked. Normal system start-up consists of placing all switches in the "AUTO" position. To shutdown the system, return all switches to the "OFF" position.

Secondary Stripper

A separate panel located in the secondary stripper shed controls operation of the secondary air stripper. All switches are appropriately designated. To start this system, place both pump switches in the "AUTO" position. To discontinue operation, return both switches to the "OFF" position.

5.3.2 Fault Reporting System

The groundwater treatment system is connected to an automated fault reporting system. This system will phone appropriate personal and report an equipment fault or high level condition should one exist. To prevent activating the fault reporting system place the appropriate zone switch, located in the alarm control panel, in the bypass position prior to shutting down any portion of the groundwater treatment system. Return the alarm system to normal operation as soon as the treatment system is returned to service.

5.3.3 Electrical Failure Reset

All of the operational controls associated with the groundwater treatment system will automatically reset when power is restored after a power failure. However, if the power failure lasted for a sufficient length of time, a high level condition may exist at the primary or secondary stripper. This situation must be manually corrected before the system can return to normal operation. The automated fault reporting system will notify appropriate personnel. However, the system should be checked for proper operation whenever there is an indication that an interruption to electrical power is likely to have occurred.

5.3.4 Monthly Maintenance and System Checks

The following are performed routinely upon inspection:

Primary Stripper Shed and Equipment

1. Visually check for damage to the building, leaks, broken pipes, loose wires and/or other operational problems.

2. Check operation of PW-1 blower. The blower should be slightly warm to the touch and vibrating slightly, if operating. If the blower is not operational, check the switch in the main panel.

3. Record total flow reading for PW-1 well pump. The flow meter is located on the influent pipe, attached to the side of the PW-1 tower. The meter currently reads total gallons or gallons per minute.

4. If necessary adjust PW-1 flow rate to 10 gpm.

5. Record total flow for both Primary Stripper dosing pumps. Each dosing pump is separately metered. The meters are located on the respective influent lines attached to the tower.

6. Check operation of Dosing Pump #1 and record flow rate. (55+ gpm)

7. Check operation of Dosing Pump #2 and record flow the rate. (55+ gpm)

8. Check operation of Primary Stripper blower.

Note: for items 1-9 it may be necessary to manually activate the blower and or pumps. To turn on each component place the appropriate operator switch, located on the system control panel, to the manual (HAND) position. **(Caution:** operation of a dosing pump without operation of the air stripper blower will cause a fault condition to be reported by the alarm system. Always turn on the blower prior to activating one of the dosing pumps.)

Secondary Stripper

1. Visually check for damage to the building, broken pipes, loose wires, leaks and/or other operational problems.

2. Check operation of Secondary Stripper blower. The blower should be slightly warm to the touch and vibrating slightly, if operational.

3. Record total flow for both Secondary Stripper dosing pumps. Flow meters are located on influent pipes, attached to the side of the Secondary Stripping Tower. The meters currently read total gallons.

4. Check manual operation of Dosing Pump #1 and record flow rate. (40+ gpm)

5. Check manual operation of Dosing Pump #2 and record flow rate. (40+ gpm)

Note: To activate a pumping cycle of the Secondary Stripper turn the cycle switch, located on the Secondary Stripper control panel, to "Activate". After recording the pump flow rate, this cycle may be terminated using the same (cycle) switch and if necessary activate another cycle, which will automatically, use the alternate pump.

Additional Checks

1. Visually check water level in North Sump by removing the manhole cover to confirm pump operation.

2. Visually check water level in East Sump by removing the manhole cover to confirm pump operation.

Note: When the sump pumps are operating properly the water level in the sumps will be maintained at or below the top of the pump.

5.3.5 Quarterly Maintenance and System Checks

The following actions are performed quarterly:

1. Check belts and service blower on Primary Air Stripper.

2. Check belts and service blower on Secondary Air Stripper.

5.3.6 Semi-Annual Maintenance and System Checks

Inspect air stripping tower media semi-annually or annually to ensure it is in usable condition. If warranted, remove, clean and/or replace air stripping tower media. If needed, remove organic debris or detritus accumulating in the tower.

5.3.7 Disposal of Used Material and Waste

At the present time, the groundwater treatment system generates no waste for offsite disposal.

5.3.8 Troubleshooting

Troubleshooting of the groundwater system can be referenced in Volume II of the Operations and Maintenance Manual.

6.0 REPORTS

6.1 Monthly Reports

The only monthly reporting requirement is SPDES reporting and SVE system monitoring with a photo-ionization detector. SPDES reports will be submitted to the NYSDEC at the end of each month. The SVE results are provided with the quarterly and annual monitoring reports. Reports will provide information collected from each of the two discharge points to include data on flow, temperature, pH and conductivity readings, and analytical data from samples tested for volatiles and freon.

6.2 Quarterly Report

A quarterly report summarizing all pertinent monthly and quarterly sampling results is provided to the NYSDEC. A monthly sample is collected at PW-1, the scavenger well. System monitoring is also conducted on a monthly basis and includes samples collected from the groundwater system at influent locations PW-1-INF, PS-INF, SS-INF and at effluent locations PW-1-EFF, PS-EFF, and SS-EFF. SVE system samples are collected monthly at SVE A, SVE B, SVE C, and SVE D. Quarterly samples are collected at production wells PW-1, PW-2, and PW-3, groundwater monitoring wells MW-4, MW-5, MW-6, MW-9, MW-10, MW-11 and MW-12, piezometers PZ-20, PZ-22, PZ-26, and PZ-27, and surface water locations SW-QUA, SW-MW4 and SW-PW2. All sampling locations can be referenced on Figure 2, RI Report and have been previously summarized at Section 4 of this report. Laboratory data will be compared with NYS groundwater standards located under 6 NYCRR Part 703 and TOGS 1.1.1. Quarterly reports will be submitted within 30 days of the end of the previous quarter.

6.3 Annual Report

An annual report summarizing all pertinent monthly and quarterly sampling results is provided to the NYSDEC. The annual report also includes a description of improvements to the system, changes in chemistry levels, a discussion of the fate and volume of the contaminants removed and predictions of future system performance.

6.4 Five Year Performance Review Report

The first five-year performance reviews will be provided to the NYSDEC at the end of the first quarter of 2003. The report will make recommendations for revisions in the sampling program and discuss the efficiency and continued operations of the existing remediation systems.

7.0 CITIZENS PARTICIPATION PLAN

Perkins Elmer in conjunction with the NYSDEC, is committed to informing area residents about upcoming activities to characterize the Rotron-Olive facility, which has been classified as a Class 2 inactive hazardous waste site. The site is currently under consideration for reclassification to a Class 4 site.

The Citizen Participation Plan also provides opportunities for the public to obtain and provide information that will enable Perkin Elmer and the NYSDEC to develop a remedial program, which is protective of both public health and the environment.

A Fact Sheet will be prepared summarizing the recent findings in preparation of reclassifying the site to a Class 4. The Fact Sheet will document improvements in site soil and groundwater quality, the results of the IRMs, contaminant removal and an outline of the ongoing remedial operations.

7.1 Contact List

A contact list has been prepared by the NYSDEC and will be kept updated based on returned mailings, public meeting sign-in sheets, and individual requests to be added to the list. To be added to the list, contact Geoff Lucetti at the NYSDOH or George Momberger at the NYSDEC, as listed below.

7.2 Regulatory Contacts

NYSDEC Remediation Project Manager:

Mr. George F. Momberger,
Division of Environmental Remediation
Bureau of Hazardous Site Control, 11th Floor
625 Broadway
Albany, New York 12233-7014

(518) 402-9551

NYSDEC Citizen Participation Specialist:

Mr. Mike Knipfing
NYS Department of Environmental Conservation
21 South Putt Corners Road
New Paltz, NY 12561

(845) 256-3154

<u>NYS Department of Health - Albany:</u>

Mr. Geoff Lucetti
Bureau of Environmental Exposure Investigation
New York State Department of Health
2 University Place Albany, NY 12203-3313

(518) 458-6305 or (800) 458-1158 extension 305

Ms. Nina Knapp
Bureau of Toxic Substance Assessment
New York State Department of Health
2 University Place
Albany, NY 12203-3313

(518) 458-6402 or (800) 458-1158 extension 402

<u>Ulster County Department of Health:</u>

Mr. Allan Dumas
Ulster County Department of Health
300 Flatbush Avenue
P.O. Box 1800
Kingston, NY 12401

(845) 338-8447

7.3 Document Depositories

Documents related to this project are available for public review at three document depositories. The depositories contain the same documents and are located as follows:

1. Olive Free Library
   Route 28A
   Olive, New York

   The telephone number for the Olive Free Library is (845) 657-2482. No appointment should be necessary for visits during normal library hours.

2. NYS Department of Environmental Conservation
   21 South Putt Corners Road

New Paltz, NY 12561
Please call Mr. Michael Knipfing at (845) 256-3154 between 8:30 am and 4:45 p.m. to make arrangements to view these documents.

8.0 PROJECT PERSONNEL

8.1 Project Organization and Personnel Responsibilities

The following personnel have been assigned to the Perkin Elmer Rotron-Olive Facility.

Corporate Environmental Attorney – Jack Healy: Mr. Healy provides oversight of project funding and allocation of funds. He does not provide oversight of the remediation facility. The Corporate Environmental Attorney can be reached at Perkin Elmer, Wellesley, Massachusetts, (781)-237-5100.

Corporate Environmental Scientist – Chip Wallace: Mr. Wallace provides technical and administrative oversight of the project including the allocation of funds. He does not provide direct oversight at the remediation facility. The Corporate Environmental Scientist can be reached at Perkin Elmer, Wellesley, Massachusetts, (781)-237-5100.

Project Manager – Jim McIver: Mr. McIver will be the primary contact with the NYSDEC. He will confirm implementation of established protocols, maintain quality and consistency, and monitor the overall work assignment, schedules, and budgets. He will be responsible for the overall implementation of the HASP, and for ensuring that all health and safety responsibilities are carried out in conjunction with this project. Mr. McIver is also the Primary Emergency Coordinator and is responsible for coordinating all emergency response measures. The Project Manager can be reached at The *Chazen* Companies Poughkeepsie, New York Office, (845) 454-3980 or via cell phone, (914) 456-3281. TCC are subcontractors to Perkin Elmer.

Field Operations Leader – Kim Cuppett: Ms. Cuppett assists the Project Manager in executing the scope of work. She supervises the daily site operations and shall act as the On-Site Safety Officer, in accordance with the HASP. The Field Operations Leader can be reached at The *Chazen* Companies Poughkeepsie, New York Office, (845) 454-3980.

Health and Safety Officer – Kim Cuppett: The Health and Safety Officer (HSO) is responsible for developing and implementing the site-specific Health and Safety Plan, and for providing any health and safety technical assistance and guidance to the PM and on-site personnel. The Health and Safety Officer can be reached at The *Chazen* Companies Poughkeepsie, New York Office, (845) 454-3980.

Field Geologist – Patrick Kelly: The field geologist will perform the field activities, including adherence to and interpretation of the HASP and quality assurance protocols, oversight of site activities, scheduled preventative maintenance, and sampling. Mr. Kelly is also the Alternate Emergency Coordinator and is responsible for coordinating emergency response measures when the Primary Emergency Coordinator is unavailable. The Field Geologist can be reached at The *Chazen* Companies Poughkeepsie, New York Office, (845) 454-3980 or via cell phone, (914) 474-5197.

System Operator – Todd Syska: Mr. Syska is responsible for the design and installation of the remediation system. He maintains detailed knowledge of system operations and is the primary point of contact for system maintenance and trouble shooting. In the event one or more of the SVE blowers cease operation for more than five minutes, Mr. Syska is automatically summoned for emergency maintenance by the SVE system's automated fault reporting system. The System Operator can be reached at Todd Syska, Inc., Clinton Corners, New York, (845) 266-8322.

8.2 Qualifications and Training

All personnel working on-site have environmental backgrounds accomplished through schooling, training or a combination of the two. All personnel conducting activities on-site for which potential health and safety impacts exist must be in compliance with all applicable Federal/State rules and regulations, including OSHA 29 CFR 1910.120, and OSHA 29 CFR 1926. Personnel shall have completed 40 hours of OSHA training and be current with their eight-hour refreshers in accordance with 29 CFR 1910.120. On–site personnel must also be familiar with the procedures and requirement of this HASP. Employees who conduct maintenance activities must receive safety training in the lockout and tagout of energized equipment. Additional safety training is required for employees who may be expected to enter or perform work in confined spaces.

Personnel who make connections and repairs to electrical and/or plumbing utilities must demonstrate knowledge of these skills. Knowledge can be presented through work experience or through a profession degree or certification.