

SOURCE AREA
CHARACTERIZATION AND
FURTHER REMEDIAL ACTIVITIES

Apple Valley
Shopping Center
Site

LaGrange, Dutchess County, New York

New York State Registry of Inactive Hazardous Waste Site No.: 314084

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TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
II. EXISTING DATA AND INFORMATION ARE ADEQUATE FOR CHARACTERIZING THE SOURCE AREA.	2
A. EXISTING DATA	2
B. EVIDENCE OF MORWHITE RELEASES	3
1. Morwhite's Delivery Methodology.	3
2. Perc Discharges by Morwhite at Apple Valley.	4
3. Records of Repairs to Morwhite Equipment.	5
4. Soil Gas Testing and Groundwater Sampling Confirm that Significant Releases of Perc Occurred at the Surface at the Hot Spot.	5
III. WORKPLAN FOR FURTHER REMEDIAL ACTIVITIES.	7
A. Area Hydrogeology	7
B. Pumping and Treatment Strategy	7
C. Assessment of Pumping and Treatment Effectiveness	7
D. Water Quality Objectives for Treatment Cessation	8
IV. CONCLUSIONS	9
A. Additional investigation is not required to adequately characterize the source area ..	9
B. Additional remedial activities will be implemented to address the "hot spot"	9
C. The progress and effectiveness of the additional remedial efforts will be verified	9

I. INTRODUCTION

In response to the August 8, 1997 letter of Michael O'Toole, Director, Division of Hazardous Waste Remediation of the New York State Department of Environmental Conservation (DEC), and in accordance with the correspondence of David Engel of Harris Beach & Wilcox, LLP., dated August 22, 1997, this Report is submitted by Galson Corporation and Harris, Beach & Wilcox, LLP., on behalf of James A. Klein Enterprises ("JAK"). JAK is the previous owner of the above-referenced site and has been identified as a "PRP" for the site by the EPA. JAK is subject to an Order on Consent issued by the EPA with respect to the site. That Order requires JAK to undertake a "Removal Action" at the site. Such Removal Action has been on-going for approximately five (5) years. The principal contaminant at the site as demonstrated by groundwater sampling, soil gas sampling and soil testing is tetrachloroethylene ("perc"); lesser quantities of trichloroethene ("TCE") and other chlorinated solvents have also been detected. The results of all sampling of all environmental media at the site have been previously and routinely provided to DEC and EPA pursuant to the EPA Order on Consent and CERCLA Section 104(e).

The primary elements of the Removal Action being undertaken by JAK at the site have consisted of the installation and operation of two air-stripper systems. One such system is located on the Apple Valley Shopping Center ("AVSC") property on a groundwater well ("Well 2"), which has served as a supply well at AVSC. The second air-stripper is attached to two private water supply wells located at residences in the adjacent Woodbridge Estate Subdivision. In addition to the sampling undertaken pursuant to the EPA-approved Work Plan for the Removal Action, JAK and other parties identified by EPA as PRPs for the site have undertaken additional site investigation activities, including sampling and testing undertaken in preparation of litigation commenced on behalf of JAK for cost recovery and contribution under provisions of the Federal CERCLA statute, i.e., *Klein v. Grand Union, et al.*¹

A petition seeking reclassification of the site was previously filed on behalf of JAK in 1996. Thereafter, in response to requests of the DEC, additional sampling was undertaken on site on behalf of JAK in January, 1997. Further, site sampling was also undertaken in January, 1997, on behalf of the Grand Union Company.

By Mr. O'Toole's correspondence of August 8, 1997, DEC indicated that:

- additional investigation is required to adequately characterize the source area;
- additional remedial activities must be implemented; and
- the progress and effectiveness of the additional remedial efforts must be verified.

Response to the concerns of DEC are set forth in this Report.

¹ *Klein v. Grand Union, et al.* is the cost recovery/contribution action in Federal Court, Southern District of New York (91-CIV-8459 (CLB)), brought by JAK against the Grand Union Company, Morwhite, Inc. and Russell and Josephine Martinson, as owners of the Norgetown laundromat and dry cleaning facility. That action has been resolved by settlements between JAK and the various defendants.

II. EXISTING DATA AND INFORMATION ARE ADEQUATE FOR CHARACTERIZING THE SOURCE AREA.

A. EXISTING DATA

The *Petition to Reclassify (Petition)* identifies much of the data collected in the area to the rear of the Apple Valley Dry Cleaners (AVDC). This area, which encompasses approximately 4200 square feet, has been extensively covered by sampling investigations of every media. These investigations have been performed using sampling densities which are extremely tight when compared to typical remedial investigations. These investigations include:

- two soil gas surveys, the most detailed of which was performed on a 14-foot grid;
- limited soil sampling programs;
- groundwater sampling; and
- aquifer pump testing.

In addition, supplementary investigations were undertaken in January 1997, including the installation of a soil boring and monitoring well in the vicinity of the "hot spot" located approximately 15 to 20 feet behind the AVDC. This "hot spot" had been previously identified during the May, 1993 soil gas survey undertaken on behalf of JAK, which showed perc in soil gas at approximately 490,000 ppb. at that location. It was the results of sampling of groundwater from the new monitoring well at the "hot spot" in January, 1997 (i.e., perc at 18 ppm) which were referenced in Mr. O'Toole's August 8, 1997 letter.

These investigations lead to several conclusions regarding the hydrogeology and geohydraulics of the site:

1. The soil gas survey identified that the principal source area at the site is located approximately 15 to 20 feet behind and to the south of the AVDC. This "hot spot" is the location at which confirmed releases of perc occurred in the course of deliveries of the solvent by Morwhite, Inc. While other sources have been identified at the site, it is clear that this "hot spot" constitutes the primary source area at the site.² The evidence obtained during discovery in *Klein v. Grand Union, et al.*, establishes that the "hot spot" or source area is due to releases of perc associated with deliveries by Morwhite, Inc., using its "hose and nozzle" system.

²

Sampling demonstrates the presence of other source areas at the site, including an area to the rear and behind the Norgetown facility. This source area is also associated with delivery activities of Morwhite. Physical evidence at the property indicates that the contamination released in this area has direct access to the groundwater aquifer at Well 2 through a fracture system that has been demonstrated to accept a significant volume of flow. As a result, contamination in this area is undergoing effective remediation by the means of the air stripper treatment system at Well 2. By comparison, the "hot spot" is in an area of the bedrock aquifer which is only poorly connected to Well 2 and the wells of the Woodbridge Estates Subdivision, as discussed in paragraph A.5.

2. Soil testing was performed on samples collected continuously from grade to the bedrock surface. The analytical results show that the soils no longer demonstrate significant levels of perc and other contaminants, including those collected at the "hot spot".
3. No groundwater was identified in the overburden.
4. Groundwater sampled from the bedrock well at the "hot spot" indicated high levels of contamination, statistically identical to samples collected in 1990 from Well 1 immediately behind the AVDC. These samples suggest that the present site remediation is having minimal impact on groundwater quality in the area of the "hot spot".
5. The constant-discharge aquifer test performed on Well 2 which now feeds the on-site low-profile air stripper indicated that the bedrock aquifer in the vicinity of Well 1 and the hot-spot well is hydraulically poorly connected to the bedrock aquifer which embraces the remainder of the site. During the entirety of the 72-hour test, there was very little response at Well 1 to the nearby pumping at Well 2. This was suggested by the poor yield of Well 1 during its use, while Well 2 produces effortlessly at 20 gallons per minute (gpm).

All these results lead to the conclusion that: the contamination which originated at the surface at the hot spot has migrated or been transported to the bedrock aquifer in that area. Residual soil contamination is minimal due to the volatilization of the contaminants into the soil gas. The groundwater contamination, which is effectively two orders of magnitude greater than that noted at any other location at the site, has slowly migrated out of this area of high concentration through a poor hydraulic connection to the remainder of the site.

B. EVIDENCE OF MORWHITE RELEASES

During discovery in *Klein v. Grand Union, et al.*, the records of deliveries of perc by Morwhite, Inc. were obtained and reviewed by counsel and consultants for JAK. The information contained in those records, particularly when considered with other information obtained during the investigation of this site, establishes that substantial releases of perc occurred during or in association with deliveries by Morwhite.

1. Morwhite's Delivery Methodology.

Initially, it should be kept in mind that Morwhite made deliveries using a "hose and nozzle" system. This system consists of a storage tank within each Morwhite delivery vehicle which is connected to a hose with a nozzle virtually identical to that which is commonly used on gasoline station pumps. Use of this system requires the extension of the hose from the parked vehicle into individual dry cleaner facilities. Thereafter, the extended hose is "charged" with perc by engagement of the pump on each vehicle. Perc is dispensed by squeezing the trigger mechanism on the nozzle so that perc is delivered to a drum or container provided for storage of perc within each dry cleaning facility. Morwhite demonstrated the operation of its "hose and nozzle" delivery system for the parties as part of the discovery process in *Klein v. Grand Union, et al.* in February, 1993. As discussed, *infra*, uncontrolled leakage from the Morwhite delivery system occurred during the demonstration. A copy of the video tape of that demonstration is available for review by the Department upon request.

2. Perc Discharges by Morwhite at Apple Valley.

a. June 2, 1992.

It is beyond dispute that a release of perc occurred during a delivery by Morwhite on June 2, 1992. Morwhite maintained that the release of perc on June 2, 1992, consisted of approximately 2 to 5 ounces. Morwhite's records indicate that 45.5 gallons of perc were delivered to the AVDC on that date; however, the recorded amounts from the master meter on the Morwhite delivery vehicle indicated that 55 gallons of perc were discharged during the delivery episode. Accordingly, approximately nine and one-half gallons may have been discharged to the environment during the June 2, 1992 release. The account of the June 2, 1992 release from the Morwhite vehicle as well as other deposition testimony establishes that the Morwhite delivery vehicle was parked at or on the "hot spot" during the course of its deliveries to the AVDC facility. The June 2, 1992 episode occurred after the AVSC had been designated as an inactive hazardous waste site by DEC. Accordingly, the June 2, 1992 episode cannot account for the underlying contamination conditions upon which the site was designated for inclusion in the State Registry.

b. November, 1985.

With respect to the contamination which existed at the time at which the AVSC was included in the Registry, Morwhite's records indicate that a substantial release occurred in November, 1985. On November 27, 1985, Morwhite delivered 25 gallons of perc to the Apple Valley Norgetown facility. At the completion of that delivery, the master meter on Morwhite delivery vehicle number 2 registered 593212.0 gallons. According to Morwhite's records for vehicle number 2, 100 gallons of perc were then delivered to the AVDC facility which was located approximately 150 feet to the east of the Apple Valley Norgetown facility. After the completion of the delivery of 100 gallons of perc to AVDC on November 27, 1985, the master meter on Morwhite vehicle number 2 registered 593372.0 gallons. Accordingly, after the completion of the delivery to AVDC, 160 gallons of perc had been discharged from the Morwhite vehicle, although only 100 gallons of perc were evidently delivered to the AVDC.

A review of the delivery records of Morwhite to the dry cleaners at the AVSC during the period 1985 - 1993, indicate a pattern of discrepancies between the quantities discharged from the delivery vehicles and the amount reported as delivered to the individual dry cleaner facilities.

c. Releases Associated with Improper Storage at the AVDC.

At the AVDC, Morwhite delivered perc to the same 55 gallon drum located at the rear of that facility for a period of approximately 14 years. In February, 1991, William Cooke, the owner of the AVDC, moved that drum for the first time during that period; upon lifting the drum, he observed a quantity of perc which had been released under the drum. The exterior of the drum in question was in a visibly rusted or corroded condition. The delivery of perc to such container was contrary to the standard of care set forth in guidance documents provided to Morwhite by its suppliers, such as Dow Chemical. Copies of such guidance documents were obtained during discovery and are available for DEC's review upon request. Testing of soil gas from beneath the AVDC in February, 1991 indicated that perc released from the drum had entered the soils beneath the floor.

3. Records of Repairs to Morwhite Equipment.

Repair records obtained in the course of discovery in *Klein v. Grand Union, et al.*, indicate that repeated problems occurred with respect to the integrity of the Morwhite delivery systems. An example of this phenomenon occurred during the demonstration by Morwhite of its delivery system in February, 1993. On that occasion, Morwhite demonstrated its delivery system at its facility at Tivoli Street, Albany, New York. During the course of the demonstration incidental leakage occurred from the nozzle to the paved ground while perc was being delivered to a 55 gallon drum. As indicated, the videotape of that demonstration prepared on behalf of Morwhite is available for review by DEC.

4. Soil Gas Testing and Groundwater Sampling Confirm that Significant Releases of Perc Occurred at the Surface at the Hot Spot.

The soil gas data establishes that the elevated levels of perc at the "hot spot" are necessarily attributable to significant surface releases of perc at that location. The chemical data collected during the various site investigations support the conclusion that the concentrations of perc at the "hot spot" are attributable to surficial release associated with deliveries by Morwhite, Inc. Contamination originating at the surface migrated to the bedrock aquifer and resulted in the contamination of the groundwater at the site. The results of the soil gas surveys and the analyses of soils and groundwater are consistent and support this conclusion.

Application of basic chemical principles to the results of the May, 1993 soil gas survey support the conclusion that the excessive concentrations noted by the soil gas survey must have resulted from the presence of pure "perc" in the unsaturated zone. That survey showed perc at 490,000 ug/l in the soil gas at the hot spot, with a large area with concentrations greater than 150,000 ug/l. These results are consistent with soils saturated with pure perc at the depth from which the soil gas samples were obtained, i.e., four feet beneath the surface. The only mechanism by which soils could be so saturated with perc would be large magnitude surface releases. This conclusion is wholly consistent with the evidence otherwise obtained in *Klein v. Grand Union, et al.*, that Morwhite had been responsible for such large scale surface releases.

The soil gas concentrations for perc at the "hot spot" of 490,000 ug/l in May of 1993 may appear to be inconsistent with the low level concentrations of perc in soil obtained in January 1997. However, application of a chemical solution described by Thibodeaux³ can be used to determine the duration of perc vapor in unsaturated soil gas. Beginning with a 500,000 ug/l average concentration and no continuing source, the vapor will be removed from a 10 foot thick unsaturated zone within less than 900 days, or less than 2.5 years. Significantly, Morwhite ceased making deliveries of perc to the AVDC in July, 1993. In fact, dry cleaning operations at AVDC ceased on or about late 1993. Therefore, the low level concentrations of perc in soil in January, 1997, are not inconsistent with the results from the May, 1993 soil gas survey.

³ Thibodeaux, L.J., 1979, Chemodynamics - Environmental Movement of Chemicals in Air, Water, and Soil, John Wiley & Sons, New York pp. 335-337.

To summarize, there is no other explanation for the "hot spot" concentrations of perc other than surface spills. Additional investigation would be superfluous in light of the extensive data and evidentiary material already obtained and reviewed with regard to this site. Accordingly, it is concluded that:

- Surface spills of perc at the "hot spot" caused contamination of the site.
- At present, there are no significant concentrations of perc in the overburden.
- Natural attenuation and evaporation, and movement of perc into the bedrock has reduced the concentration of perc in the soils.

III. WORKPLAN FOR FURTHER REMEDIAL ACTIVITIES.

This Workplan has been prepared by Galson Corporation and should be considered an addendum to the previous *Workplan, Apple Valley Shopping Center Superfund Site, LaGrange, New York, Superfund Emergency Removal Action (USEPA Workplan)* under which all remedial activities at this site have taken place. The details of the current treatment system and rationale, and the objectives and assessment methodology for the analytical data may be found in the *USEPA Workplan* and are not reiterated here. This Workplan outlines the remediation proposed for the area of the hot spot; the details of the overall program into which this remedial effort dovetails may be found in the *USEPA Workplan*.

A. Area Hydrogeology

Existing data indicates that the area immediately to the rear of the AVSC is a tight hydrogeologic unit. Yields of 5 gpm or less severely tax the aquifer, resulting in significant drawdowns within the pumping well (i.e. about 40 feet). Pumping from outside this tight section has minimal influence on the wells within this tight zone (i.e. 2-3 inches drawdown when about five feet was anticipated). Because of this, the remedial alternative selected for this area must provide for a slow continuous pumping rate.

B. Pumping and Treatment Strategy

It is proposed that a pump be inserted into the well at the hot spot. This pump will be plumbed into the existing low-profile air stripper, and the discharge will augment the 20 gpm flowing through the air stripper from Well 2. This air stripper is sized such that it can easily accept and treat the additional flow.

This hot spot well, HS-1, will be initially pumped at 5 gpm. The drawdown in the well will be monitored during the first day of pumping to determine if and when it stabilizes. If excessive drawdown occurs, the pumping rate will be adjusted until a sustainable, stabilized drawdown is achieved. During the first month of pumping, the water level will be checked at least weekly to insure that the drawdown is still stable. It will then be checked monthly. The character of this aquifer is such that there may be yield problems during sustained pumping; it will be important to identify and rectify these issues by adjusting the pumping rate before they become problems.

The discharge from the well will be treated by the low-profile air stripper, which is the treatment technology accepted by the USEPA for this site. Treatment by granular activated carbon is not feasible because of the high contaminant loadings.

C. Assessment of Pumping and Treatment Effectiveness

To provide for monitoring the raw discharge of HS-1, a sampling port will be plumbed into the line before the connection to the discharge piping from Well 2. Samples from this port, which will be designated HS-1, the combined raw water input to the air stripper (AVS-Influent), and the discharge from the air stripper (AVS-Effluent) will be collected at the end of the day that the HS-1 pump is brought on-line, but no earlier than six hours into pumping to allow for the combined influent to fully cycle through the air stripper. One duplicate sample will also be collected, and a trip blank will be

analyzed. These samples will form the baseline against which the effect of the pumping and treatment will be measured.

These samples will be submitted to the project's laboratory, Matrix Analytical, Inc., for analysis by USEPA Method 524.2, which is the project's standard analytical procedure and provides for a detection limit of 0.5 micrograms per liter.

Samples from these three ports will be collected quarterly for one year, and then semi-annually with the remainder of the samples collected at the site. The chemical analyses obtained by this monitoring will be compared to previously collected untreated groundwater chemistry data to demonstrate the improvement in groundwater quality achieved by the pumping program. They will also be used to calculate the volume of contaminant removed by the pumping at HS-1. The air-stripper data will document the effectiveness of the treatment system.

D. Water Quality Objectives for Treatment Cessation

The water quality objectives for treatment cessation will be the same as defined in the *USEPA Workplan*. That is, the standards for treatment cessation (STC's) at HS-1 are defined as one-half of the existing maximum contaminant level, or 2.5 micrograms per liter for all compounds of concern with the exception of vinyl chloride, which is 1.0 microgram per liter.

IV. CONCLUSIONS

A. Additional investigation is not required to adequately characterize the source area

This site has been studied, sampled, tested and analyzed to the point of material exhaustion. Understanding of the site is complete and has repeatedly been verified by additional data collection efforts.

B. Additional remedial activities will be implemented to address the "hot spot"

In light of the groundwater sample result referenced in your letter, it is clear that limited additional remedial activities are required at the site; specifically in the area of the "hot spot". This Workplan addendum outlines the anticipated activities to address this concern.

C. The progress and effectiveness of the additional remedial efforts will be verified

It is agreed that such further remedial efforts must be monitored to insure their effectiveness. This Workplan addendum outlines the proposed monitoring activities to meet this concern.

d by
ERG, INC.
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5128

MEMORANDUM

To: David A. Engel

From: Theresa A. Beddoe **TAB**

Date: May 2, 1994

Re: **Excavation of the Sewer Lateral, Apple Valley Shopping Center.**

This is to report on the excavation of the sewer lateral extending from the Apple Valley Dry Cleaners to the manhole in the rear of the Apple Valley Shopping Center which was undertaken on May 2, 1994. This line had previously been inspected by the use of video equipment during which an offset was discovered in the line. Several individuals were present to inspect the sewer line. These included Ernie Henzler; four gentlemen from RGH Construction who performed the excavation and subsequent refitting of the line; Russ Martinson; Andrew Gilchrist and Joanne Gray; Paul Ciminello, Tom Vormbrock and Lee Harrison; and Nancy Clark of Chazen Engineering and Steve Lyons from MHPC who represented the Town of LaGrange.

The 3" thick pavement of the shopping center was opened using a jack hammer. First excavated was a telephone cable conduit which had filled with water due to a breach in the top of the pipe. When the soils were removed, the water was released and flowed from the top fissure for a brief period of time.

Next excavated was the sewer lateral. Inspection revealed that the original asbestos clay ("transite") pipe had previously been cleanly truncated (flat ends) and refitted using PVC SDR 35 sewer pipe attached to the transite pipe using Fernco couplings. These couplings were secured both to the PVC and to the SDR with screw clamps. As these couplings are flexible, they are designed to flex as the bedding material subsides; this resulted in the noted offset. All parties were allowed to examine and photograph or videotape the exposed flexed repair before the pipe was removed.

No evidence was found of any leakage from the sewer lateral; no staining or discoloration of soils was noted, and no pooled liquids were observed. The soils were uniformly moist but not wet. No evidence was found of any failure of either the original PVC SDR 35 pipe or of the couplings themselves. Although the couplings had flexed, there was no evidence of cracking or other defect which might have transmitted sewerage into the soils. When the pipe was removed, the Fernco coupling was shown to have been secured tightly 3"-4" up onto both the transite and PVC pipes. The pipe, both upstream and downstream of the break, was checked using a flashlight and a shovel handle and was determined to be clear.

Additional material was removed to provide an improved bed for the lateral. Further inspection revealed that directly beneath the sewer lateral was the water line from well #2 to the pump house.

The underlying material was tamped using a vibratory compactor. Two lifts of Item #4 (gravel with silt fines) were then compacted for the bed of the pipe.

The top of the sewer pipe was determined to be 30" below grade.

The sewer lateral was refitted using water-supply-line grade materials: Blue Brute PVC pipe and Smith and Blair Pressure Fittings designed to withstand 200 psi. After placing the pipe and tightening the couplings, The hole was backfilled with approximately 6" of Item #4 and these were tamped. Native soils were then used to fill the hole to about 4" below grade and were tamped. Three lifts of compacted Item #4 finished the backfill. The surface was not paved.

This operation required approximately four hours and fifteen minutes to complete. Work began at approximately 8:45AM and finished at 1:00PM.